



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,795	01/22/2004	Herbert Bruder	P03,0591	5384

26574 7590 05/31/2005

SCHIFF HARDIN, LLP
PATENT DEPARTMENT
6600 SEARS TOWER
CHICAGO, IL 60606-6473

EXAMINER

HO, ALLEN C

ART UNIT PAPER NUMBER

2882

DATE MAILED: 05/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/762,795

Applicant(s)

BRUDER ET AL.

Examiner

Allen C. Ho

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 18-37 is/are rejected.
- 7) ☒ Claim(s) 16, 17, 38, and 39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 062004, 071904
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 51 , α , $\Delta\beta$.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 37 (Fig. 2).

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:
 - (1) Page 12, line 12, " $2_{2\max}$ " should be replaced by $--2\beta_{2\max}--$.
 - (2) Page 13, line 7, " Y_1, Y_2 " should be replaced by $--\gamma_1, \gamma_2--$.
 - (3) Page 13, line 13, "first radiator" should be replaced by $--second radiator--$.

- (4) Page 14, line 6, "Y₁" should be replaced by -- γ_1 --.
- (5) Page 14, line 11, "Y₂" should be replaced by -- γ_2 --.
- (6) Page 14, line 18, "Y₁ - Y₂" should be replaced by -- $\gamma_1 - \gamma_2$ --.
- (7) Page 14, line 19, "Y₁, Y₂" should be replaced by -- γ_1, γ_2 --.

Appropriate correction is required.

Claim Objections

- 4. Claims 11 and 28 are objected to because of the following informalities: line 2, --system- - should be inserted "second data acquisition". Appropriate correction is required.
- 5. Claims 9 and 26 are objected to because of the following informalities: line 9, --second-- should be inserted between "said" and "angular". Appropriate correction is required.

Claim Rejections - 35 USC § 112

- 6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- 7. Claims 9 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 and 26 recite a difference between the first angular position and the second angular position is a whole number, odd multiple of $\frac{1}{2}$ of the element separation. It is unclear whether the difference is a whole number or an odd multiple of $\frac{1}{2}$ of the element separation.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-3, 5, 6, 11-14, 18-20, 22, 23, 28-30, 35, 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Swerdloff *et al.* (U. S. Patent No. 5,724,400).

With regard to claim 1, Swerdloff *et al.* disclosed an imaging tomography apparatus comprising: a first data acquisition system comprising a first radiator (28) and a first detector (30); a second data acquisition system comprising a second radiator (32) and a second detector (105); a gantry (14) to which the first data acquisition system and the second data acquisition system are mounted for rotation around a common rotation axis; and during rotation around the common rotation axis, the first data acquisition system and the second data acquisition system respectively scanning maximum measurement fields that differ in size from each other (a tumor is smaller than the body of a patient).

With regard to claim 18, Swerdloff *et al.* disclosed an imaging tomography apparatus comprising: a first data acquisition system comprising a first radiator (28) and a first detector (30); a second data acquisition system comprising a second radiator (32) and a second detector (105); a gantry (14) to which the first data acquisition system and the second data acquisition system are mounted for rotation around a common rotation axis; and a setting

arrangement (required to collimate a point x-ray source) for setting the measurement field for at least one of the first data acquisition system and the second data acquisition system so that the respective measurement fields differ in size from each other.

With regard to claims 2 and 19, Swerdloff *et al.* disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein the first radiator is a first x-ray radiator, the first x-ray detector is a first x-ray detector, the second radiator is a second x-ray radiator (column 1, lines 27-30), and the second detector is a second x-ray detector, and wherein the first data acquisition system generates a first set of computed tomography projection data, and wherein the second data acquisition system generates a second set of computed tomography projection data (both detectors are connected to image reconstructor, Fig. 6).

With regard to claims 11 and 28, Swerdloff *et al.* disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein the first data acquisition system and the second data acquisition system are mounted so as to be separated from each other, in respective planes, along the common rotation axis (the radiators are separated, Fig. 2).

With regard to claims 12 and 29, Swerdloff *et al.* disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein at least one of the first and second data acquisition system is mounted so as to be movable relative to the other of the first and second data acquisition systems along the common rotation axis (if it can be mounted, it can be moved), to cause the first and second data acquisition systems to be respectively disposed in different planes.

With regard to claims 3 and 20, Swerdloff *et al.* disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein the maximum fan angle of the first radiation

Art Unit: 2882

beam being different from the maximum fan angle of the second radiation beam (a tumor is smaller than the body of a patient).

With regard to claims 5, 6, 22, and 23, Swerdloff *et al.* disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein the maximum measurement field of the first data acquisition system has a size for scanning an entirety of the body cross-section of the patient, and wherein the maximum measurement field of the second data acquisition system has a size for scanning only a part of the body cross-section of the patient (CT and radiation treatment).

With regard to claims 13 and 35, Swerdloff *et al.* disclosed an imaging tomography apparatus as claimed in claims 1 and 18, further comprising an operating unit (61) for allowing a selection to be made between a first scanning mode (CT) with the larger maximum measurement field and a second scanning mode (radiation treatment and verification) with the smaller maximum measurement field.

With regard to claims 14 and 36, Swerdloff *et al.* disclosed an imaging tomography apparatus as claimed in claims 13 and 35, wherein the operating unit, in the first scanning mode, deactivates the data acquisition system having the smaller maximum measurement field (therapy planning session, column 7, lines 55-67).

With regard to claim 30, Swerdloff *et al.* disclosed an imaging tomography apparatus as claimed in claim 18, wherein the measurement field of one of the data acquisition systems does not overlap the measurement field of the other data acquisition system.

10. Claims 1, 3-6, 10, 13-15, 18, 20-23, 27, 30, and 35-37 are rejected under 35 U.S.C. 102(b) as being anticipated by Pflaum (U. S. Patent No. 6,198,790 B1).

With regard to claim 1, Pflaum disclosed an imaging tomography apparatus comprising: a first data acquisition system comprising a first radiator (1) and a first detector (3); a second data acquisition system comprising a second radiator (11) and a second detector (13); a gantry (10) to which the first data acquisition system and the second data acquisition system are mounted for rotation around a common rotation axis; and during rotation around the common rotation axis, the first data acquisition system and the second data acquisition system respectively scanning maximum measurement fields that differ in size from each other (Fig. 1).

With regard to claim 18, Pflaum disclosed an imaging tomography apparatus comprising: a first data acquisition system comprising a first radiator (1) and a first detector (3); a second data acquisition system comprising a second radiator (11) and a second detector (13); a gantry (10) to which the first data acquisition system and the second data acquisition system are mounted for rotation around a common rotation axis; and a setting arrangement (required to collimate a point x-ray source) for setting the measurement field for at least one of the first data acquisition system and the second data acquisition system so that the respective measurement fields differ in size from each other (Fig. 1).

With regard to claims 3 and 20, Pflaum disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein the maximum fan angle of the first radiation beam being different from the maximum fan angle of the second radiation beam (the first detector and the second detector have different widths as shown in Fig. 1).

With regard to claims 4 and 21, Pflaum disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein the first detector has a first length measured in an azimuthal direction relative to the common rotation axis, and wherein the second detector has a second

Art Unit: 2882

length measured in the azimuthal direction, the first and the second lengths being different (Fig. 1).

With regard to claims 5, 6, 22, and 23, Pflaum disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein the maximum measurement field of the first data acquisition system has a size for scanning an entirety of the body cross-section of the patient, and wherein the maximum measurement field of the second data acquisition system has a size for scanning only a part of the body cross-section of the patient (Fig. 1).

With regard to claims 10 and 27, Pflaum disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein the first data acquisition system and the second data acquisition system are mounted in a common plane (on the same gantry as shown in Fig. 1).

With regard to claims 13 and 35, Pflaum disclosed an imaging tomography apparatus as claimed in claims 1 and 18, further comprising an operating unit (8,15) for allowing a selection to be made between a first scanning mode (CT) with the larger maximum measurement field and a second scanning mode (radiograph) with the smaller maximum measurement field.

With regard to claims 14 and 36, Pflaum disclosed an imaging tomography apparatus as claimed in claims 13 and 35, wherein the operating unit, in the first scanning mode, deactivates the data acquisition system having the smaller maximum measurement field (when not activated or between pulses, column 3, lines 16-51).

With regard to claims 15 and 37, Pflaum disclosed an imaging tomography apparatus as claimed in claims 13 and 35, wherein, in the second scanning mode, the operating unit activates both the first and second data acquisition systems (column 3, lines 16-45).

With regard to claim 30, Pflaum disclosed an imaging tomography apparatus as claimed in claim 18, wherein the measurement field of one of the data acquisition systems does not overlap the measurement field of the other data acquisition system.

11. Claims 1, 3, 5-8, 10, 13-15, 18, 20, 22-25, 27, 30-32, and 35-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakashima *et al.* (U. S. Pub. No. 2003/0076927 A1).

With regard to claim 1, Nakashima *et al.* disclosed an imaging tomography apparatus comprising: a first data acquisition system (11) comprising a first radiator (111) and a first detector (113); a second data acquisition system (12) comprising a second radiator (121) and a second detector (123); a gantry (1) to which the first data acquisition system and the second data acquisition system are mounted for rotation around a common rotation axis; and during rotation around the common rotation axis, the first data acquisition system and the second data acquisition system respectively scanning maximum measurement fields that differ in size from each other (Figs. 5-8).

With regard to claim 18, Nakashima *et al.* disclosed an imaging tomography apparatus comprising: a first data acquisition system (11) comprising a first radiator (111) and a first detector (113); a second data acquisition system (12) comprising a second radiator (121) and a second detector (123); a gantry (1) to which the first data acquisition system and the second data acquisition system are mounted for rotation around a common rotation axis; and a setting arrangement (112, 122) for setting the measurement field for at least one of the first data acquisition system and the second data acquisition system so that the respective measurement fields differ in size from each other (Figs. 5-8).

With regard to claims 3 and 20, Nakashima *et al.* disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein the maximum fan angle of the first radiation beam being different from the maximum fan angle of the second radiation beam (Figs. 5-8).

With regard to claims 5, 6, 22, and 23, Nakashima *et al.* disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein the maximum measurement field of the first data acquisition system has a size for scanning an entirety of the body cross-section of the patient, and wherein the maximum measurement field of the second data acquisition system has a size for scanning only a part of the body cross-section of the patient (CT and radiation treatment).

With regard to claims 7, 8, 24, and 25, Nakashima *et al.* disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein each of the first detector and the second detector is comprised of a plurality of detector elements disposed in an azimuthal direction relative to the common rotation axis, and wherein the detector elements of the first detector having an element separation between successive detector elements that is equal to an element separation between the respective detector elements of the second detector (stationary/rotate type, paragraph [0023]).

With regard to claims 10 and 27, Nakashima *et al.* disclosed an imaging tomography apparatus as claimed in claims 1 and 18, wherein the first data acquisition system and the second data acquisition system are mounted in a common plane (on the same gantry).

With regard to claims 13 and 35, Nakashima *et al.* disclosed an imaging tomography apparatus as claimed in claims 1 and 18, further comprising an operating unit (21) for allowing a selection to be made between a first scanning mode (CT) with the larger maximum measurement

Art Unit: 2882

field and a second scanning mode (radiation treatment and verification) with the smaller maximum measurement field.

With regard to claims 14 and 36, Nakashima *et al.* disclosed an imaging tomography apparatus as claimed in claims 13 and 35, wherein the operating unit, in the first scanning mode, deactivates the data acquisition system having the smaller maximum measurement field (S1-S7).

With regard to claims 15 and 37, Nakashima *et al.* disclosed an imaging tomography apparatus as claimed in claims 13 and 35, wherein, in the second scanning mode, the operating unit activates both the first and second data acquisition systems (S8-S15).

With regard to claims 30-32, Nakashima *et al.* disclosed an imaging tomography apparatus as claimed in claim 18, wherein the setting arrangement is a gating device comprising movable diaphragm plates (112).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swerdloff *et al.* (U. S. Patent No. 5,724,400) as applied to claim 30 above, and further in view of Wagner (U. S. Patent No. 4,371,976).

With regard to claims 31 and 32, Swerdloff *et al.* disclosed an imaging tomography apparatus as claimed in claim 30. However, Swerdloff *et al.* failed to teach a gating device comprising movable diaphragm plates.

Wagner disclosed an imaging tomography apparatus comprising a gating device having movable diaphragm plates (111, 112).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a gating device having movable diaphragm plates, since a person would be motivated to define a measurement field by limiting x-rays emitted from a point x-ray source.

14. Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swerdloff *et al.* (U. S. Patent No. 5,724,400) as applied to claim 30 above, and further in view of Horiuchi (U. S. Patent No. 6,633,627 B2).

With regard to claims 33 and 34, Swerdloff *et al.* disclosed an imaging tomography apparatus as claimed in claim 30. However, Swerdloff *et al.* failed to teach a filter device comprising a plurality of filters.

Horiuchi disclosed an imaging tomography apparatus comprising a filter device (6) having a plurality of filters (6a, 6b, 6c). Horiuchi taught that high-contrast CT images of a region can be obtained by employing a suitable filter for that region.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a filter device comprising a plurality of filters, since a person would be motivated to obtain high-contrast CT images which is easy to use in diagnosis.

Art Unit: 2882

15. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pflaum (U. S. Patent No. 6,198,790 B1) as applied to claim 30 above, and further in view of Wagner (U. S. Patent No. 4,371,976).

With regard to claims 31 and 32, Pflaum disclosed an imaging tomography apparatus as claimed in claim 30. However, Pflaum failed to teach a gating device comprising movable diaphragm plates.

Wagner disclosed an imaging tomography apparatus comprising a gating device having movable diaphragm plates (111, 112).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a gating device having movable diaphragm plates, since a person would be motivated to define a measurement field by limiting x-rays emitted from a point x-ray source.

16. Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pflaum (U. S. Patent No. 6,198,790 B1) as applied to claim 30 above, and further in view of Horiuchi (U. S. Patent No. 6,633,627 B2).

With regard to claims 33 and 34, Pflaum disclosed an imaging tomography apparatus as claimed in claim 30. However, Pflaum failed to teach a filter device comprising a plurality of filters.

Horiuchi disclosed an imaging tomography apparatus comprising a filter device (6) having a plurality of filters (6a, 6b, 6c). Horiuchi taught that high-contrast CT images of a region can be obtained by employing a suitable filter for that region.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a filter device comprising a plurality of filters, since a person would be motivated to obtain high-contrast CT images, which is easy to use in diagnosis.

Allowable Subject Matter

17. Claims 16, 17, 38, and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) Ozaki (U. S. Patent No. 6,876,719 B2) disclosed an x-ray CT apparatus comprising three data acquisition systems.
- (2) Jaffray *et al.* (U. S. Patent No. 6,845,502 B2) disclosed cone-beam CT comprising two data acquisition systems (Fig. 2).
- (3) Hoffman (U. S. Patent No. 6,819,738 B2) disclosed a CT imaging system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

Art Unit: 2882

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen C. Ho
Primary Examiner
Art Unit 2882

26 May 2005